

## **REMARKS**

In view of the following remarks, Applicants respectfully request reconsideration and allowance of the subject application. This Response is believed to be fully responsive to all issues raised in the Office action mailed 10/17/2005 (hereinafter “the present Office action”).

### **Claim Amendments**

Claims 1, 4, and 23 have been amended as set forth in the Listing of the Claims above.

Claims 3, 4, 23, and 24 have been canceled.

New claims 25, 26, 27, and 27 have been added.

### **Claim Rejections**

#### **35 USC §103(a)**

Claims 1 – 6, 10, 12 – 16, and 21 – 24 stand rejected under 35 USC § 103(a) as being unpatentable over USPN 6,678,421 to Daniell et al. (hereinafter “Daniell”) and Yang et al., “A Semantic Classification and Composite Indexing Approach to Robust Image Retrieval”, IEEE, 1999 (hereinafter “Yang”).

Claims 7 and 17 stand rejected under 35 USC § 103(a) as being unpatentable over Daniell and Yang in further view of Ohta et al., “Color Information for Region Segmentation,” Computer Graphics and Image Processing, 13:222-241, 1980.

Claims 8 and 18 stand rejected under 35 USC § 103(a) as being unpatentable over Daniell and Yang in further view of Hatipoglu et al., “Texture Classification Using Dual-Tree Copmlex Wavelet Transform,” IEEE, 1999, 344-347.

Claims 9 and 19 stand rejected under 35 USC § 103(a) as being unpatentable over Daniell and Yang in further view of USPN 6,317,517 to Lu.

Claims 11 and 20 stand rejected under 35 USC § 103(a) as being unpatentable over Daniell and Yang in further view of USPN 6,594,383 to Syeda-Mahmood.

**Claim 1**, as amended, reads as follows:

1. A method of semantically classifying an image, the method comprising:

forming a group of hierarchical layered blocks from the image, each block within the group being only partially coextensive with the other blocks of the group;

determining a posterior estimate of class membership of the group of hierarchical layered blocks, the estimate being based upon class likelihoods of the hierarchical layered blocks in the group, such likelihood being conditioned on data extracted from hierarchical layered blocks in the group;

semantically classifying a portion of such image based upon the posterior estimate of class membership conditioned on the data extracted from the group of hierarchical layered blocks local to such portion.

In rejecting claim 1, the Office appears to be equating the group of hierarchical layered blocks of claim 1 with multilevel decomposition pyramid of figures 3 and 4 of Daniell. (See the last full paragraph on page 2 of the present Office action).

Claim 1 has been amended to clarify that each block within a group is only partially coextensive with the other blocks of the group. For example, as shown in Fig. 1 of the present invention, blocks 112a, 122a, and 132a together form a group of hierarchical layered blocks. In this example, block 122a is only partially coextensive with block 112a. That is, block 122a comprises only a sub-section of block 112a. Likewise, block 122a is only partially coextensive with block 122a. Similarly, blocks 212, 222, and 232 of Fig. 1 illustrate another example of a group of hierarchical layered blocks, wherein the blocks of the group are only partially coextensive.

In contrast to the group of hierarchical layered blocks recited in claim 1, the decomposition pyramids described in Daniell are apparently constructed such that each image subband comprises the entire original image, with the image subbands in higher levels comprising reduced sizes and qualities (e.g., filtered) of the entire original image region. (See Figs. 3 and 4 of Daniell). Stated another way, the size and qualities of the subbands in Daniell

are different in the various levels, but all of the subbands are completely coextensive, not partially coextensive.

Applicants have reviewed Yang and can find no discussion therein of the use of hierarchical layered blocks, wherein each block within a group is only partially coextensive with the other blocks of the group, as recited and defined in claim 1.

Since each of the operations recited in claim 1 are carried out with respect to hierarchical layered blocks, wherein each block within the group is only partially coextensive with the other blocks of the group, the combination of Daniell and Yang does not teach or suggest any of the operations recited in claim 1.

As noted in MPEP § 706.02(j), “To establish a prima facie case of obviousness, . . . the prior art reference (or references when combined) must teach or suggest all the claim limitations. As described, the combination of Daniell and Yang does not teach any of the operations recited in claim 1. For at least this reason, claim 1 is believed to be in condition for allowance, and such allowance is respectfully requested.

Each of **claims 2 and 5 - 13** depends in some form from claim 1 and, therefore, includes all the limitations of claim 1. Therefore, claims 2 and 5 - 13 are patentable over the combination of Daniell and Yang for at least the reasons set forth above with respect to claim 1. Each of claims 2 and 5 - 13 also recites additional features that are not taught by the combination of Daniell and Yang and are also not taught by Daniell and Yang in combination with any of the other references cited by the Office in the present Office action. For at least this reason, claims 2 and 5 - 13 are believed to be in condition for allowance, and such allowance is respectfully requested.

**Claim 14**, as amended, reads as follows:

14. A semantic image classification system, comprising:
  - a block analyzer configured to extract low-level features of blocks of an image and estimate class likelihoods for each block, a class being a discriminating semantic classification and a block being a portion of the image;
  - a combiner configured to generate a posterior estimate of class membership based on combining estimated class likelihoods of hierarchical

sets of blocks, a hierarchical set of blocks being a hierarchical organized and associated blocks that are only partially coextensive with one another;

an image classifier configured to determine and classify one of multiple discriminating semantic classifications to localized portions of the image based upon the posterior estimate of class membership of blocks comprising such portions.

As with respect to claim 1, in rejecting claim 14 the Office appears to be equated the blocks in the group of hierarchical layered blocks of claim 1 with the image subbands of the multilevel decomposition pyramids of Daniell.

Claim 14 has been amended to clarify that the combiner is configured to generate a posterior estimate of class membership based on combining estimated class likelihoods of hierarchical sets of blocks, where the hierarchical set of blocks is hierarchical organized and associated blocks that are only partially coextensive with one another.

As described above with respect to claim 1, the image subbands of the multilevel decomposition pyramids of Daniell are completely coextensive with one another, not partially coextensive. As also described above with respect to claim 1, Yang likewise does not describe the use of hierarchical blocks that are only partially coextensive with one another.

It of course follows that since Daniell and Yang do not describe a hierarchical set of blocks, as recited in claim 14, the combination of Danielle does not and Yang describe a combiner as recited in claim 14, which is configured to generate a posterior estimate of class membership based on combining estimated class likelihoods of such blocks.

As described, the combination of Daniell and Yang does not teach the combiner of claim 14. For at least this reason, claim 14 is believed to be in condition for allowance, and such allowance is respectfully requested.

Each of claims **15 - 22** depends in some form from claim 14 and, therefore, includes all the limitations of claim 14. Therefore, claims 15 - 22 are believed to be patentable over the combination of Daniell and Yang for at least the reasons set forth above with respect to claim 14. Each of claims 15 - 22 also recites additional features that are not taught by the combination of Daniell and Yang and are also not taught by Daniell and Yang in combination with any of the other references cited by the Office in the present Office action. For at least this reason, claims

15 - 22 are believed to be in condition for allowance, and such allowance is respectfully requested.

New claims 25 – 28 have been added. These new claims are believed to be allowable over the cited references, as none of the cited references, either alone or in combination, teach or suggest the methods recited in the claims.

## CONCLUSION

In view of all the foregoing, it is submitted that the pending claims of the present application are all in condition for allowance and such allowance is earnestly solicited. In the event that there are any outstanding matters remaining in the present application, the Office is invited to contact the undersigned to discuss the matters.

No extensions of time or additional fees are believed to be due with respect to the submission of this Amendment. However, if an extension of time is deemed necessary, Applicants hereby request such extension of time and authorize the Office to charge any associated fees to Deposit Account No. 50-0463.

Respectfully submitted,

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